IN THE CLAIMS

Applicants are amending the claims so that, after amendment, the claims will read as set forth in the clean version thereof which appears below. For the convenience of the Examiner, all of the pending claims are set forth below, whether amended or not. Further, the claims are set forth in logical order, rather than in numerical order. Enclosed with this Amendment is a marked-up version of the claims, showing in bold type the changes which have been made to the claims by this Amendment.

Please cancel Claims 3 and 12 without prejudice.

4. (Amended) An apparatus, comprising an infrared detector with a plurality of detector elements that each include:

an amorphous silicon portion which has a selected temperature coefficient of resistance; and

first and second electrodes which are electrically coupled to said amorphous silicon portion at spaced locations thereon, said first and second electrodes and said amorphous silicon portion having a structural configuration which is selected to provide between said first and second electrodes through said amorphous silicon portion at a given temperature a resistance which is selected substantially independently of said temperature coefficient of resistance;

wherein said amorphous silicon portion is a layer having each of said first and second electrodes on one side thereof; and

including a third electrode on a side of said amorphous silicon layer opposite from said first and second electrodes, said third electrode having respective portions which are each aligned with a respective one of said first and second electrodes;

wherein said first and second electrodes are made of a material which absorbs thermal energy, are in thermal communication with said amorphous silicon portion, and are sufficiently thin so that they are substantially absorbing to infrared radiation; and

wherein said electrodes are made from an alloy which includes aluminum and titanium.

5. (Amended) An apparatus according to Claim 4, wherein said alloy used for said electrodes includes approximately equal amounts of aluminum and titanium.

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2. (Twice Amended) An apparatus according to Claim 4,

wherein said amorphous silicon portion has a level of doping selected to provide said amorphous silicon portion with said selected temperature coefficient of resistance; and

wherein said structural configuration of said electrodes and said amorphous silicon portion is selected to set said resistance substantially independently of said doping level.

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6. (Twice Amended) An apparatus according to Claim 4, wherein said infrared detector includes an integrated circuit, a membrane having therein said amorphous silicon portion and said electrodes, and structure which supports said membrane at a location spaced above said integrated circuit and which

electrically couples each of said first and second electrodes to said integrated circuit.

7. An apparatus according to Claim 6,

wherein said integrated circuit has thereon below said membrane a reflective surface which reflects infrared radiation; and

wherein a distance between said reflective surface and said membrane is selected as a function of infrared wavelengths of interest, so that a region between said membrane and said reflective surface will serve as a resonant cavity for said wavelengths of interest.

8. An apparatus according to Claim 7, wherein said membrane has therethrough a plurality of openings.

9. An apparatus according to Claim 8, wherein said openings each have a transverse dimension which is approximately twice said distance.

13. (Twice Amended) An apparatus according to Claim 4, including spaced first and second layers made of a material which is electrically insulating and substantially transparent to infrared radiation, said amorphous silicon layer and said electrodes being disposed between said first and second layers.

28. (Amended) A method of making an infrared detector having a plurality of detector elements, comprising the steps of:

providing an amorphous silicon layer which has a selected temperature coefficient of resistance;

fabricating first and second electrodes which are at spaced locations on one side of said amorphous silicon layer and which are electrically coupled to said amorphous silicon layer, including the step of selecting as a material for said first and second electrodes an alloy which contains titanium and aluminum, and the step of structurally configuring said first and second electrodes and said amorphous silicon layer so as to provide between said first and second electrodes through said amorphous silicon layer at a given temperature a resistance selected substantially independently of said temperature coefficient of resistance; and

fabricating a third electrode from said alloy on a side of said amorphous silicon layer opposite from said first and second electrodes, said third electrode having respective portions which are each aligned with a respective one of said first and second electrodes.

38. (New) A method according to Claim 28, wherein said step of selecting said alloy includes selecting said alloy to have approximately equal amounts of aluminum and titanium.

29. A method according to Claim 28,

wherein said step of providing said amorphous silicon layer includes the step of doping said amorphous silicon layer to a level which provides said selected temperature coefficient of resistance; and

wherein said steps of fabricating said third electrode and configuring said first and second electrodes and said

amorphous silicon layer are carried out so as to set said resistance substantially independently of said doping level.

30. A method according to Claim 28, wherein said step of fabricating said first and second electrodes includes the steps of forming said first and second electrodes from a material which absorbs thermal energy and which is in thermal communication with said amorphous silicon layer, and forming said first and second electrodes to be sufficiently thin so that they are substantially absorbing to infrared radiation.

31. A method according to Claim 28, further including the steps of:

supporting at a location spaced above an integrated circuit a membrane which has therein said amorphous silicon layer and said electrodes;

electrically coupling said first and second electrodes to said integrated circuit; and

providing on said integrated circuit below said membrane a reflective surface which reflects infrared radiation, wherein a distance between said reflective surface and said membrane is selected as a function of infrared wavelengths of interest, so that a region between said membrane and said reflective surface will serve as a resonant cavity for radiation having said wavelengths of interest.

39. (New) An apparatus comprising an infrared detector having a plurality of detector elements that each include:

a thermally sensitive portion which has an electrical characteristic that varies as a function of a temperature of said thermally sensitive portion; and

structure which is made of an alloy containing titanium and aluminum, which is thermally coupled to said thermally sensitive portion, which absorbs thermal energy from infrared radiation that impinges on the detector element, and which transfers thermal energy to said thermally sensitive portion.

40. (New) An apparatus according to Claim 39,

wherein said structure includes first and second electrodes that are electrically coupled to said thermally sensitive portion at spaced locations thereon, said first and second electrodes being electrically and thermally conductive, and being sufficiently thin so that they absorb infrared radiation; and

including circuitry which is electrically coupled to said first and second electrodes, and which is capable of measuring said electrical characteristic of said thermally sensitive portion through said electrodes.

41. (New) An apparatus according to Claim 40,

wherein said infrared detector includes a substrate having said circuitry therein; and

wherein each said detector element includes a membrane supported in spaced relation to said substrate and having therein said thermally sensitive portion and said first and second electrodes.

42. (New) An apparatus according to Claim 40, wherein said thermally sensitive portion includes amorphous silicon.

43. (New) An apparatus according to Claim 39,

including first and second electrodes that are electrically coupled to said thermally sensitive portion at spaced locations thereon, said first and second electrodes being electrically conductive;

including circuitry which is electrically coupled to said first and second electrodes, said circuitry being capable of measuring said electrical characteristic of said thermally sensitive portion through said electrodes; and

wherein said structure includes a layer which is made of said alloy, which is spaced from said electrodes, and which is sufficiently thin so that it absorbs infrared radiation.

44. (New) An apparatus according to Claim 43,

wherein said infrared detector includes a substrate having said circuitry therein; and

wherein each said detector element includes a membrane supported in spaced relation to said substrate and having therein said thermally sensitive portion, said layer, and said first and second electrodes.

45. (New) An apparatus according to Claim 43, wherein said layer is a further electrode, said first and second electrodes being disposed on one side of said thermally sensitive portion and said further electrode being disposed on an opposite side of said thermally sensitive portion.

46. (New) An apparatus according to Claim 43, wherein said thermally sensitive portion includes amorphous silicon.

47. (New) A method of making an infrared detector having a plurality of detector elements, comprising the steps of:

providing a thermally sensitive portion which has an electrical characteristic that varies as a function of a temperature of said thermally sensitive portion; and

fabricating structure which is made of an alloy containing titanium and aluminum, which is thermally coupled to said thermally sensitive portion, which absorbs thermal energy from infrared radiation that impinges on the detector element, and which transfers thermal energy to said thermally sensitive portion.

48. (New) A method according to Claim 47,

wherein said step of fabricating said structure includes the step of fabricating first and second electrodes that are electrically coupled to said thermally sensitive portion at spaced locations thereon, said first and second electrodes being electrically and thermally conductive, and being sufficiently thin so that they absorb infrared radiation; and

including the step of fabricating circuitry within said infrared detector which is electrically coupled to said first and second electrodes, and which is capable of measuring said electrical characteristic of said thermally sensitive portion through said electrodes.

49. (New) A method according to Claim 48,

including the step of configuring said infrared detector to have a substrate with said circuitry therein; and

including the step of configuring each said detector element to include a membrane supported in spaced relation to

said substrate and having therein said thermally sensitive portion and said first and second electrodes.

50. (New) A method according to Claim 48, including the step of configuring said thermally sensitive portion to include amorphous silicon.

51. (New) A method according to Claim 47, including the steps of:

fabricating first and second electrodes which are electrically coupled to said thermally sensitive portion at spaced locations thereon, said first and second electrodes being electrically conductive;

configuring said infrared detector to include circuitry which is electrically coupled to said first and second electrodes, said circuitry being capable of measuring said electrical characteristic of said thermally sensitive portion through said electrodes; and

configuring said structure of each said detector element to include a layer which is made of said alloy, which is spaced from said electrodes, and which is sufficiently thin so that it absorbs infrared radiation.

52. (New) A method according to Claim 51, including the step of configuring said infrared detector to have a substrate with said circuitry therein; and

configuring each said detector element to have a membrane which is supported in spaced relation to said substrate and which has therein said thermally sensitive portion, said layer, and said first and second electrodes.

53. (New) A method according to Claim 51, wherein said step of configuring said structure includes the step of configuring said layer to be a further electrode which is disposed on a side of said thermally sensitive portion opposite from said first and second electrodes.

54. (New) A method according to Claim 51, including the step of configuring said thermally sensitive portion to include amorphous silicon.

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1. An apparatus, comprising an infrared detector with a plurality of detector elements that each include:

an amorphous silicon portion;

first and second insulating portions provided at spaced locations on said amorphous silicon portion; and

first and second electrodes which are electrically coupled to said amorphous silicon portion at spaced locations thereon, a substantial portion of said first electrode being disposed on said first insulating portion, and a substantial portion of said second electrode being disposed on said second insulating portion.

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32. An apparatus according to Claim 1, wherein said first and second electrodes are made of a material which absorbs thermal energy, are in thermal communication with said amorphous silicon portion, and are sufficiently thin so that they are substantially absorbing to infrared radiation.

33. An apparatus according to Claim 32, wherein said electrodes are made from an alloy which includes aluminum and titanium.

34. An apparatus according to Claim 32, wherein said electrodes are made from an alloy which includes approximately equal amounts of aluminum and titanium.

35. An apparatus according to Claim 1, wherein said infrared detector includes an integrated circuit, a membrane having therein said amorphous silicon portion, said insulating portions and said electrodes, and structure which supports said membrane at a location spaced above said integrated circuit and which electrically couples each of said first and second electrodes to said integrated circuit.

36. An apparatus according to Claim 35,

wherein said integrated circuit has thereon below said membrane a reflective surface which reflects infrared radiation; and

wherein a distance between said reflective surface and said membrane is selected as a function of infrared wavelengths of interest, so that a region between said membrane and said reflective surface will serve as a resonant cavity for said wavelengths of interest.

37. An apparatus according to Claim 1, wherein said first and second electrodes have interdigitated fingers.

16. A method of making an infrared detector having a plurality of detector elements, comprising the steps of:

providing an amorphous silicon portion which has a selected temperature coefficient of resistance;

fabricating first and second insulating portions at spaced locations on said amorphous silicon portion; and

fabricating first and second electrodes which are at spaced locations on said amorphous silicon portion and which are electrically coupled to said amorphous silicon portion, including the step of structurally configuring said electrodes so that a substantial portion of said first electrode is disposed on said first insulating portion, and a substantial portion of said second electrode is disposed on said second insulating portion.

18. A method according to Claim 16, wherein said step of fabricating said electrodes includes the steps of forming said electrodes from a material which absorbs thermal energy and which is in thermal communication with said amorphous silicon portion, and forming said electrodes to be sufficiently thin so that they are substantially absorbing to infrared radiation.

REMARKS

Claims 3 and 12 have been canceled, and Claims 2, 4-6, 13 and 28 have been amended. Claims 38-54 have been added. Claims 1-2, 4-9, 13, 16, 18 and 28-54 are thus present in the application. Reconsideration of the application, as amended, is respectfully requested.

Patentable Subject Matter

Noted with appreciation is the indication in the Office Action that Claims 1, 16, 18 and 32-37 have been allowed.